REPORT ON RECONNAISSANCE WORK

IN THE M1, M2 and QULIK 1 CLAIMS,

CHANTREY INLET, N.W.T.

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MINERAL DEVELOPMENT AGREEMENT

INTRODUCTION

A reconnaissance study was carried out on the areas staked by Megagem, Inc. as the M1, M2 and Qulik 1 claims, on the eastern shore of Chantrey Inlet, N.W.T. The study was financed by contracts from the Geology Office, INAC Yellowknife and Indian Minerals West, Calgary.

The study was performed between July 31 and August 19, 1988. However, a substantial part of this time was lost due to adverse weather conditions. Actual time in field amounted to 8 days, which prevented us from examining areas of potential interest outside the claim properties.

This report is based on field observations and is restricted to geological observations. Any comments on economic aspects of individual commodities should be taken in a purely qualitative sense. Studies of economic feasibility and marketing should be conducted in the future by appropriate professionals, if development of one or more commodities is contemplated.

Very few official names of geographic features are available in the local areas examined here. For the purpose of communication in this report, geographic and geological names are used as shown in Fig. 47.

LOCATION AND GENERAL GEOLOGY

The properties investigated here are located on the eastern shore of Chantrey Inlet, N.W.T. The M1 and M2 claims are at 67°39'N/95°33'W, 11 km southeast of Cape Barclay. The Qulik 1 claim covers an island, locally known as Glass Island, in a constricted part of Chantrey Inlet east of Victoria Headland and south of Backhouse Point; it is located at 67°18'N/95°22'W.

The country east of the eastern shoreline of Chantrey Inlet is underlain by Archean (?) metadioritic basement hosting three greenstone belts: Chantrey in the south, Barclay, and Hay in the north (Fritsch et al. 1984). Chantrey belt is best exposed and mapped in detail; Barclay belt is poorly exposed, and Hay belt is known only from a very limited outcrop on the shoreline (Fig. 47).

Stratigraphy, lithology and structure of the Chantrey belt were described by Fritsch et al. (1984) in detail, whereas the Barclay belt was only briefly examined.

The M1 and M2 claims are located on the near-shore exposure of the Barclay belt, whereas the Qulik 1 claim covers a unit of the Chantrey belt.

THE BARCLAY BELT

The Barclay belt extends at least 60 km to the northeast (Fig. 47), and attains a maximum width of 5 km (Fritsch et al. 1984).

Regional lithologies

Within the limits of the near-shore exposure, the Barclay greenstone belt consists of dominantly subvertically dipping, northeast striking metavolcanic rocks, metapelites (with andalusite, cordierite, staurolite),

chlorite schists grading into garnet-rich silicate ironstones, with limited quartz-eye schist, amphibolite, magnetite-bearing iron formation, marble, quartzite and metaconglomerate.

Late intrusions

Two granitic intrusions are observed in Barclay belt (Fig. 48).

The Orange granite in the north is a medium-grained leucogranite with abundant patches of pegmatitic texture, in part veined by fracture-filling pegmatite dikes (Fig. 36). Its contacts are covered by overburden, except the southeastern margin which seems to be faulted against micaschists. No rare-element minerals were observed in this intrusion.

The Southeastern granite is largely composed of the pegmatitic leucogranite facies of fertile intrusions generating rare-element pegmatites (Fig. 6-8) (Cerný et al. 1981; Meintzer, 1987; Cerný and Meintzer, 1988). Layers of medium-grained leucogranite and sodic aplite are very exceptional. Pods of potassic pegmatite containing garnet, quasi-graphic garnet + quartz intergrowths, and beryl are present mainly on Beryl Island and the peninsula south of Camp Alex (Fig. 10, 11). The two intrusions marked on Fig. 48 are relatively homogeneous and continuous bodies. To the southwest, in the vicinity of Camp Alex and on the nearby islands, the Southeastern granite forms dikes cross-cutting regional foliation (Fig. 1, 12). However, an early generation of the leucogranite is also present, constituting sill-like intrusions parallel to foliation and extensively mylonitized (Fig. 4,5).

Pegmatites

Pegmatites are found in three areas: immediately northwest of Camp

Alex, approximately halfway between Camp Alex and Columbite Bay, and in a swarm trending northeast from Columbite Bay (Fig. 48,49).

Subvertical pegmatites adjacent to Camp Alex site (Fig. 13) are relatively simple, in part transitional from the pegmatitic leucogranite to the southeast. Garnet and beryl are seemingly the only accessory minerals; muscovite is very subordinate, and medium-grained albite occurs locally in the central parts marked by quartz pods (Fig. 14).

Pegmatites between Camp Alex and Columbite Bay are sparse. They contain cleavelandite, and one of them some beryl. The northeastern pair of pegmatites resembles those in the northeastern extremity of the third swarm.

The pegmatite swarm extending northeast of Columbite Bay is the most populated and mineralized one. The pegmatites are subvertical, essentially parallel to the foliation of the host schists, and discordance can be established only locally (Fig. 19). Internal structure ranges from homogeneous in the northeastern primitive types, through local development of blocky pods in the interior (Fig. 21, 23, 24), to distinct zoning (Fig. 20). Exomorphic tourmalinization is rare (Fig. 23).

Beryl is found in most pegmatites except those in extreme northeast; garnet is uncommon but muscovite is found in several generations, cleavelandite is widespread (Fig. 18), and columbite plus some radioavtive minerals resembling monazite or zircon (Fig. 17) were found in the pegmatite centered on the shoreline of Columbite Bay (Fig. 16). Weathered triphylite (Fig. 24) and other (probable) phosphates were found in the pegmatite separated from others along the southern shoreline of Garnet Point, east of Columbite Bay.

Quartz veins

Quartz veins of variable strike but generally subvertical dip crosscut the foliation of metamorphic rocks southeast of Camp Alex and to the east of Garnet Point. Some of them carry columnar tourmaline along contact (Fig. 25, 26). Others tend to develop vugs lined with quartz crystals and occasionally filled with carbonates. Large cleavage fragments of what seems to be pale-green plagioclase were found in loose broken-up material; in one case this mineral was found in situ, associated with muscovitized andalusite.

CHANTREY GREENSTONE BELT

The Chantry belt extends about 175 km to the northeast from the eastern shoreline of the Inlet, and also continues to the southwest (Fig. 47). It attains maximum width of 5 km (Fritsch et al. 1984).

This belt was visited only on the Glass Island (covered by the Qulik 1 claim; Fig. 37) which consist of only one rock type.

Quartzite

Purplish quartzite, coloured probably by finely dispersed hematite, constitutes Glass Island (Fig. 38). No other metamorphic rock types were encountered, except very few streaks of phyllitic schist along the southeastern shoreline.

Pegmatites

Pegmatite dikes roughly conformable with the northeastern strike and subvertical dip of the quartzites are encountered in the central and

southeastern parts of the Island (Fig. 39). No accessory minerals were found in these pegmatites, over and above feldspars, quartz and muscovite.

Quartz veins

Quartz veins of highly variable attitudes, attaining 65 cm in width, are abundant along the steep cliffs over the northwestern shoreline of the island (Fig. 42), and under the sedimentary overburden of the northeastern extremity of the island (Fig. 40). They are rare to absent elsewhere on the island.

The veins have in most cases a cross-columnar texture; quartz is largely milky (Fig. 43, 44) but in cavities it shows clear overgrowths on euhedral crystals. Fibrous aggregates of hematite are rarely found on the quartz crystals.

ORE MINERALS, INDUSTRIAL MINERALS AND COLLECTIBLES

The abundance, quality and potential uses of the different commodities available on the M1, M2 and Qulik 1 claims (plus their broader vicinity, where applicable) will be commented on here.

Beryl

Large crystals of beryl are sparsely scattered in potassic pegmatite pods of the pegmatitic leucogranites at Camp Alex. They are somewhat more abundant in the pegmatite swarm northeast of Columbite Bay, but considerably variable in size.

Beryl is only very exceptionally of gem quality; gem-stock typical of miarolitic pegmatites (California, Brazil, Namibia, Afghanistan, Pakistan)

cannot be expected at Chantrey Inlet.

Beryl is suitable as a collectible and souvenir material.

Garnet

Small euhedral crystals, and larger (to 5 cm) garnet + quartz intergrowths are found mainly at Camp Alex, associated with beryl in potassic pods of the pegmatitic leucogranites.

Garnet is very abundant in the silicic ironstones at Garnet Point. Weathered schists offer limited quantities of collectible material with well-exposed subhedral to euhedral garnet crystals (Fig. 31). Garnet-rich schists can provide virtually unlimited material for cut-and-polished souvenir material.

Columbite-tantalite and radioactive minerals

So far, the minerals were found in insignificant amounts in a single pegmatite.

Triphylite

Triphylite and other (probable) phosphates may amount to a very limited supply of collectibles. However, their main significance is in their geochemical indication of a Li-aluminosilicate potential in the pegmatite field (Trueman and Cerný, 1982).

Unknown pegmatite minerals

Several minerals found in the pegmatites are still to be identified. However, they occur in extremely small quantities and they may only be

significant as geochemical indicators, if at all.

Tourmaline

Tourmaline occurrences in the pegmatites (internally and in metasomatic exocontacts) are extremely limited. However, tourmaline bordering some of the quartz veins can be excavated as collectible and souvenir stock.

Quartz

Only a very limited supply of vug-lining quartz crystals is indicated at Camp Alex and Garnet Point but the reserves on Glass Island may be rather extensive. Collectible specimens, souvenir-grade material, and quartz crystals for enhancement of soapstone carvings should be available in abundance.

Andalusite

There is a virtually unlimited supply of chiastolite north and northeast of Garnet Point, in a 10 m wide layer of metapelites (Fig. 27-29, 33-35). Individual crystals are on the average about 1.5 x 6 cm but are commonly larger, reaching 2.5 x 25 cm. They represent good collectible material (particularly where associated with, or enclosing staurolite), and souvenir stock for cut-and-polished tablets.

SUMMARY

No economically feasible accumulations of pegmatitic ore minerals were found, although the accessory mineralogy indicates a potential for beryl and possible presence of Li-aluminosilicates.

Beryl and garnet in the pegmatites can be extracted, by aid of surface blasting, as collectible and souvenir stock.

Tourmaline from the quartz veins can be similarly obtained for collector and souvenir trade.

Quartz has considerable potential on Glass Island.

Andalusite and garnet in schists at Garnet Point can be worked for collectibles and cut-and-polished tablets for souvenirs.

It should be noted that the appeal of collectibles will be in their "exotic" provenance, rather than the quality of the material which is rather run-of-the-mill (with the exception of the very best possible chiastolite specimens).

Souvenir material should be attractive, all the more that (to the best of our knowledge) rocks and minerals have not yet been offered in the western Canadian arctic and subarctic.

RECOMMENDATIONS

As a fundamental basis for further geological work, detailed air photographs are essential for the three claims and other areas of interest, at a scale of about 1:5000.

Geological studies

Pegmatite populations of both Barclay and Chantrey belts should be examined, as the mineralogy of the pegmatitic leucogranites and pegmatites in the M1 claim indicates a potential for Be, Nb-Ta and Li deposits.

Detailed study of metamorphic grades and gradients should be conducted to aid in pegmatite prospecting (Trueman and Cerný, 1982).

Structural statistical study of the quartz vein distribution and attitude should be conducted on the Qulik 1 claim, in correlation with the occurrences of crystal-lined cavities, to develop exploration criteria for cavity location.

The quartzite unit containing crystal-bearing cavities should be examined in its mainland continuation to the northeast of Glass Island.

Feasibility studies

Techniques for liberation of the metamorphic minerals, pegmatite minerals and quartz veins in the field should be developed.

Experimental excavation, cutting and polishing of the garnet- and chiastolite-bearing rocks should be initiated, to establish a practical procedure for systematic production.

Production cost of the above should be correlated with market potential.

A market study should be conducted for the collectibles and souvenirs - beryl, garnet, tourmaline, quartz crystals, and uncut andalusite and garnet.

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Figures

Note: Besides reference numbers as used throughout the text, the figures are also identified by the film-negative frame numbers as classified in the principal investigator's files.

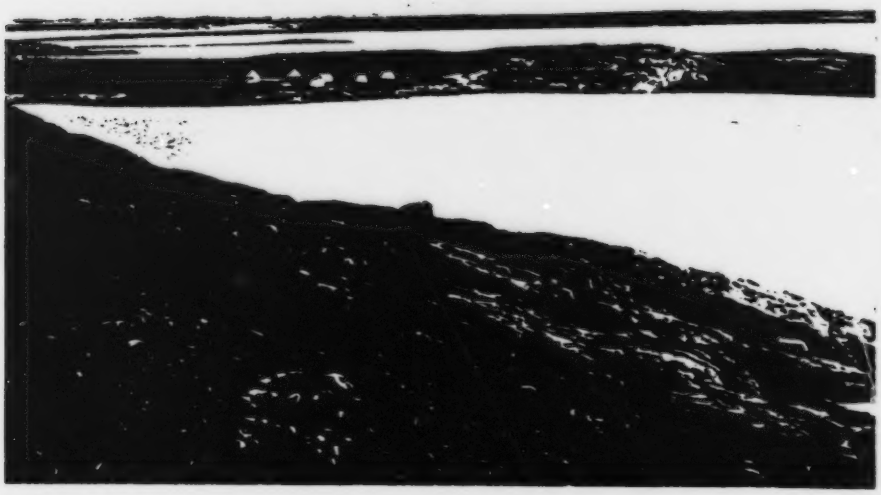

Fig. 1 (#238-11). Camp Alex, viewed from west. Dikes of pegmatitic leucogranite corsscutting the point of land to the south of the Camp.

Fig. 2 (#242-3). Layered feldspar-phyric metavolcanic rocks on the point of land south of Camp Alex.

Fig. 3 (#239-8). Layered feldspar-phyric metavolcanic rocks with felsic and mafic inclusions on the point of land south of Camp Alex.

Fig. 4 (#241-37). Early sheared sills of pegmatitic leucogranite on the point of land south of Camp Alex.

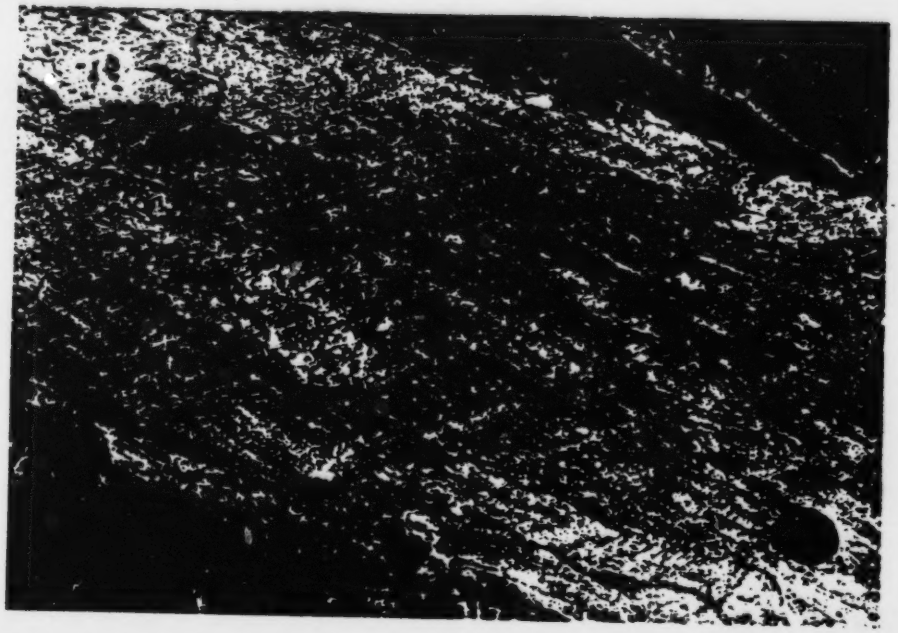

Fig. 5 (#238-34). Detail of early sheared sills of pegmatitic leucograinite shown in Fig. 4. Porphyroclasts of K-feldspar (beige), felsic (white) and mica-enriched (grey) mylonite.

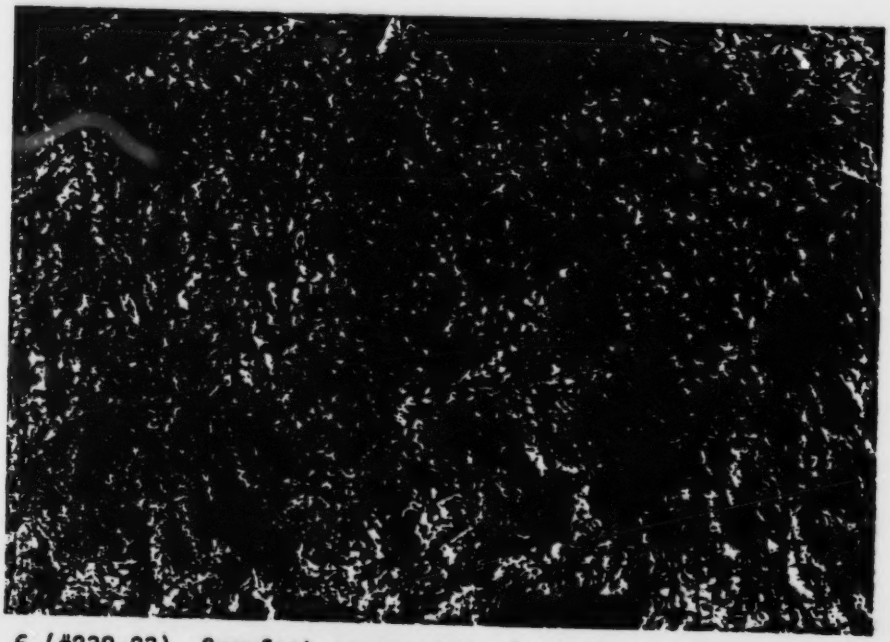

Fig. 6 (#239-23). Crowfoot aggregates of biotite in pegmatitic leucogranite dikes within the Camp Alex campsite.

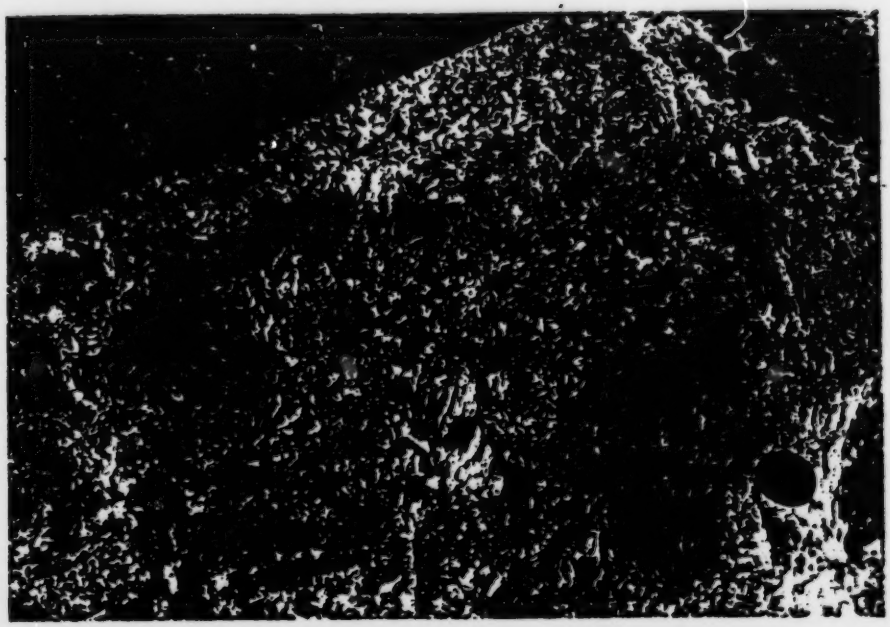

Fig. 7 (#240-2). Course quasi-graphic muscovite in graphic feldspar + quartz along the hangingwall contacts of pegmatitic leucogranite dikes on the point of land south of Camp Alex.

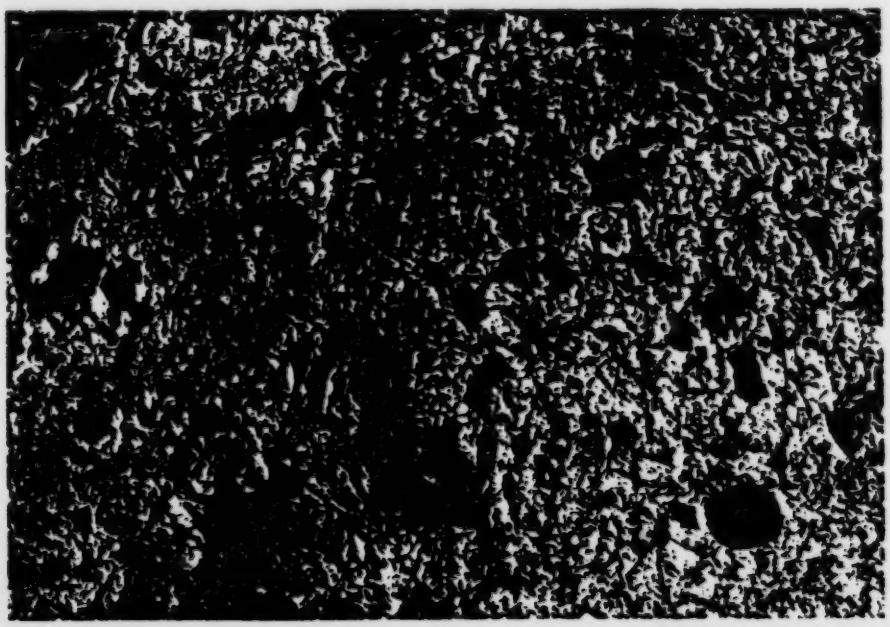

Fig. 8 (#240-3). Clusters of fine-grained quasi-graphic muscovite + quartz + feldspar matrix along the footwall contacts of pegmatitic leucogranite dikes on the point of land south of Camp Alex.

Fig. 9 (#239-34). Beryl Island (to the right) south of Camp Alex, an outcrop of pegmatitic leucogranite.

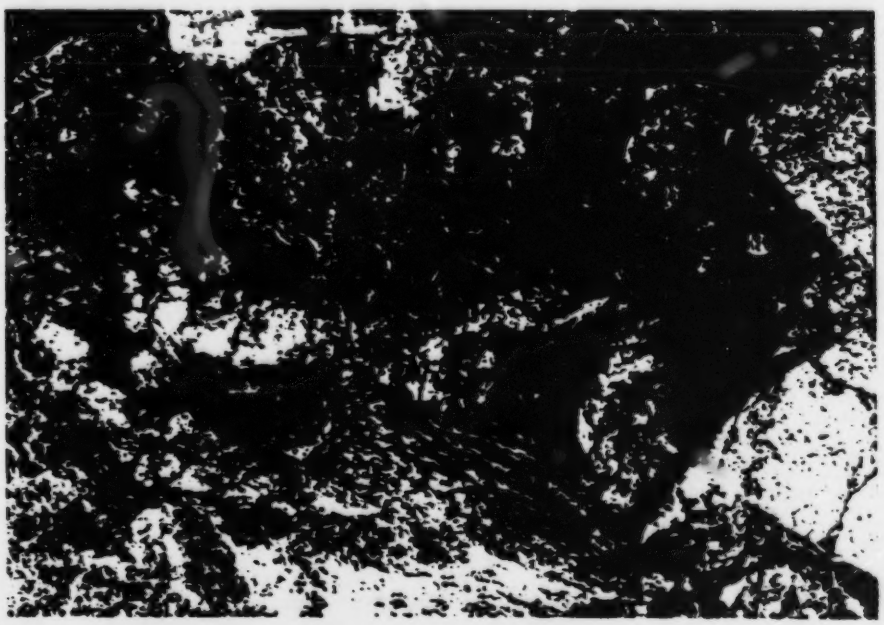

Fig. 10 (#237-33A). Greenish columnar crystals of beryl in pods of potassic pegmatite facies of the pegmatitic leucogranite on Beryl Island.

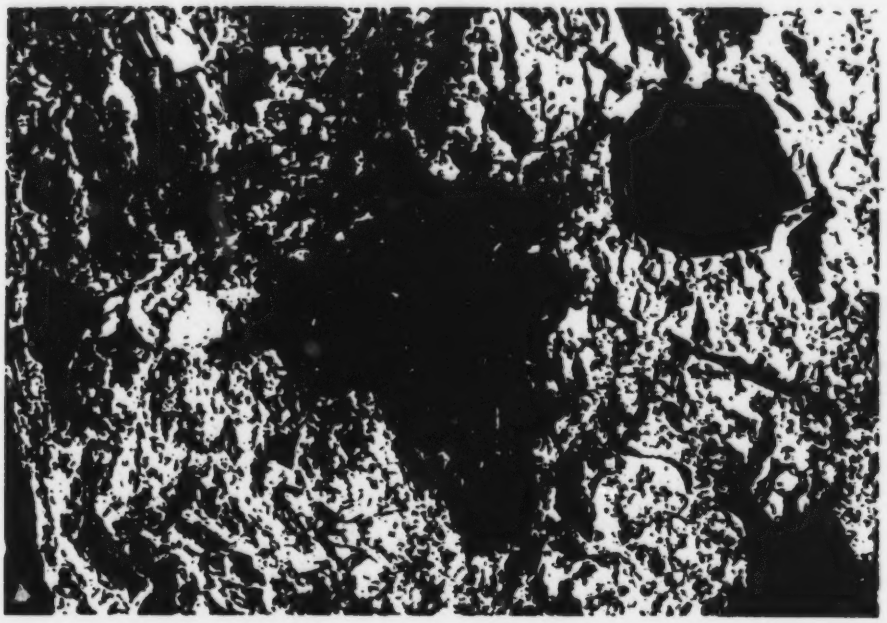

Fig. 11 (#237-34A). Garnet + quartz intergrowths in pods of potassic pegmatite facies of the pegmatitic leucogranite on Beryl Island.

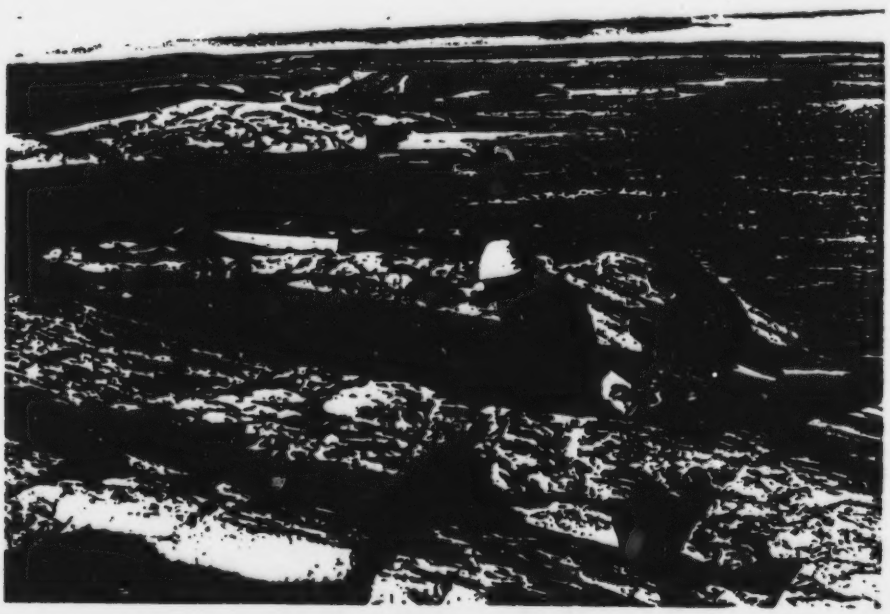

Fig. 12 (#239-2). Outcrops of pegmatitic Southeastern Granite dikes on islands northeast of Beryl Island.

Fig. 13 (#239-25). Pegmatite dikes west of Camp Alex, viewed from the campsite.

Fig. 14 (#238-9). Garnet-bearing albite (brown) in quartz pods of the main dike west of Camp Alex (cf. Fig. 13).

Fig. 15 (#239-6). Quartz vein with some tourmaline along contacts with metavolcanic host rock, point of land south of Camp Alex.

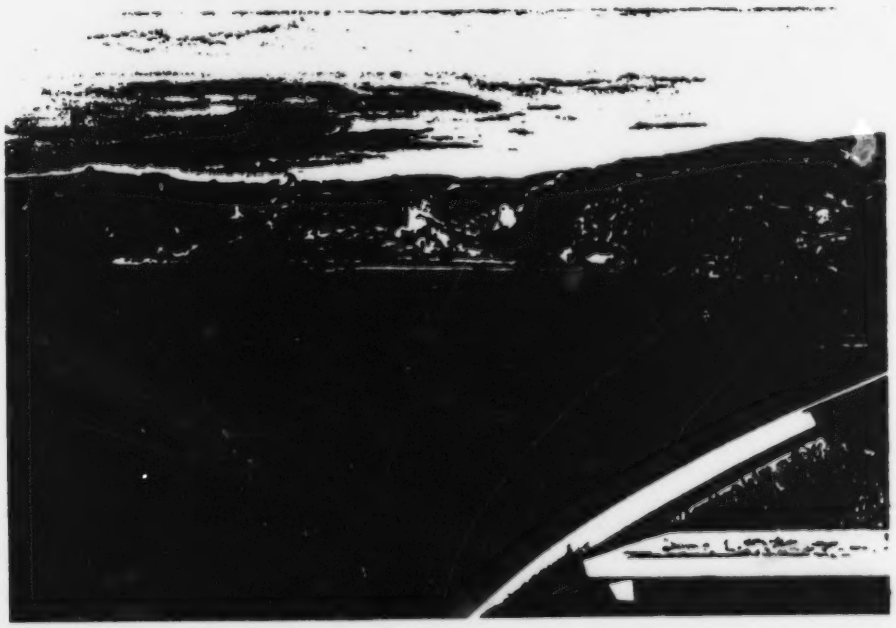

Fig. 16 (#242-25). Columbite Bay on Garnet Point, northwest of Camp Alex. Pegmatite dike No. 1 viewed along strike in the centre.

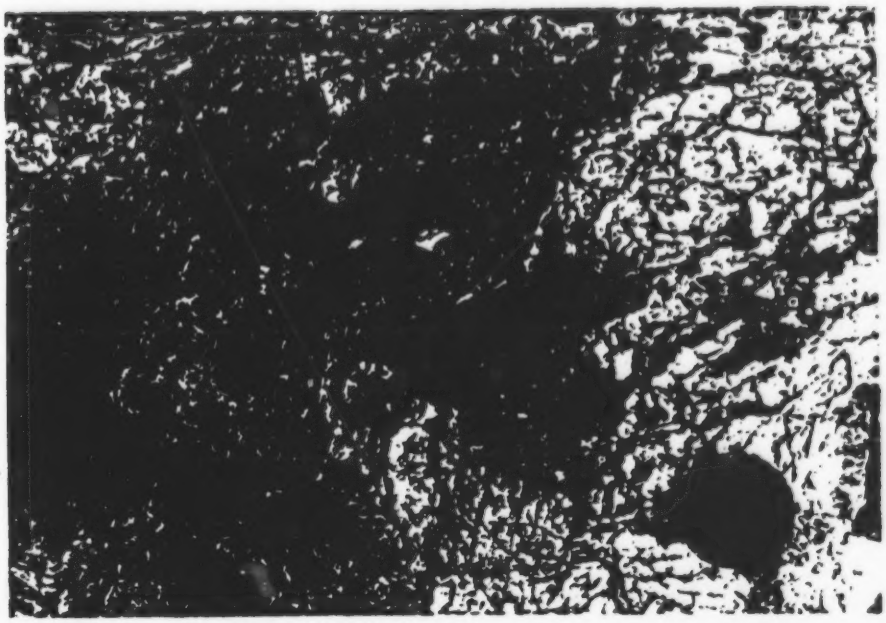

Fig. 17 (#240-9). Columnar columbite (black), beryl (yellow) and radioactive minerals (brown) in pegmatite No. 1, Garnet Point.

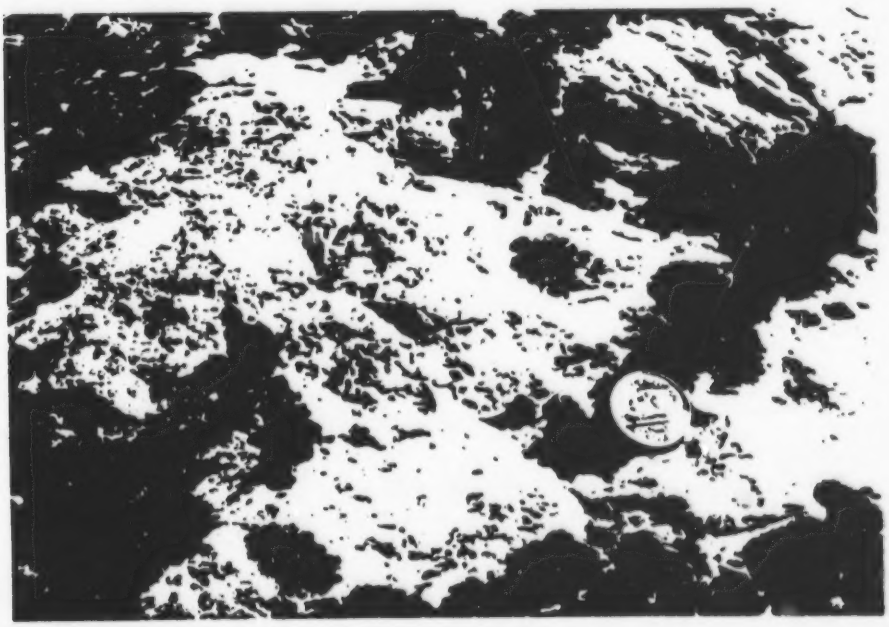

Fig. 18 (#240-28). Cleavelandite (white) in pegmatite No. 1, Garnet Point.

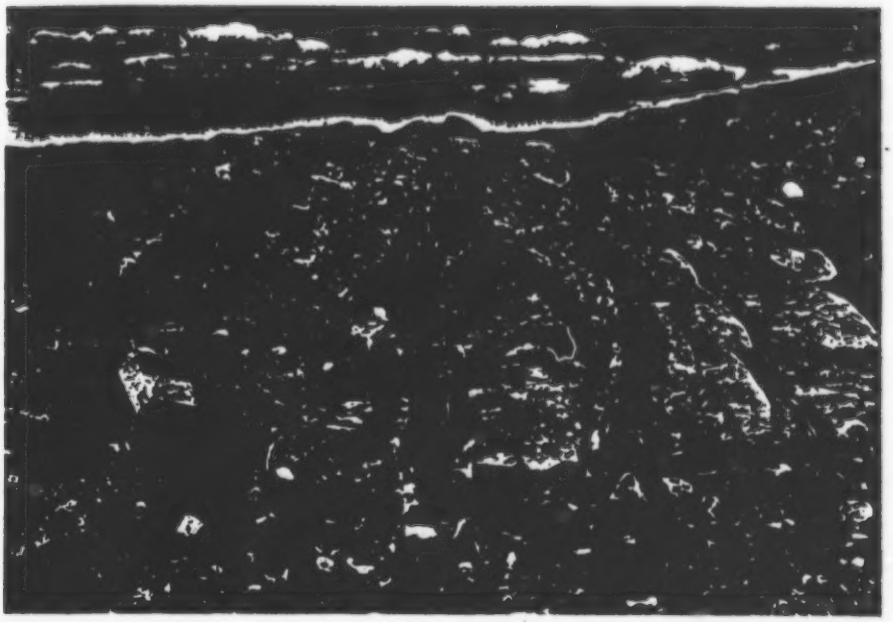

Fig. 19 (#241-7). Subparallel pegmatite dikes separated by screens of metapelites, at Garnet Point.

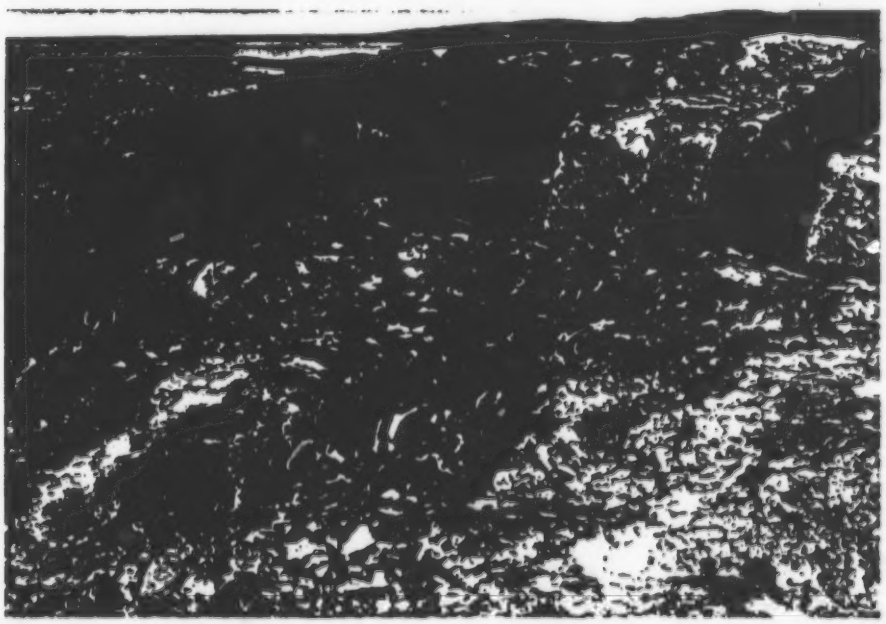

Fig. 20 (#241-6). Symmetric zoning in a pegmatite dike at Garnet Point; pods of core quartz in the central parts.

Fig. 21 (#241-9). Giant club-shaped K-feldspar in a pegmatite dike at Garnet Point, 1.8 m long.

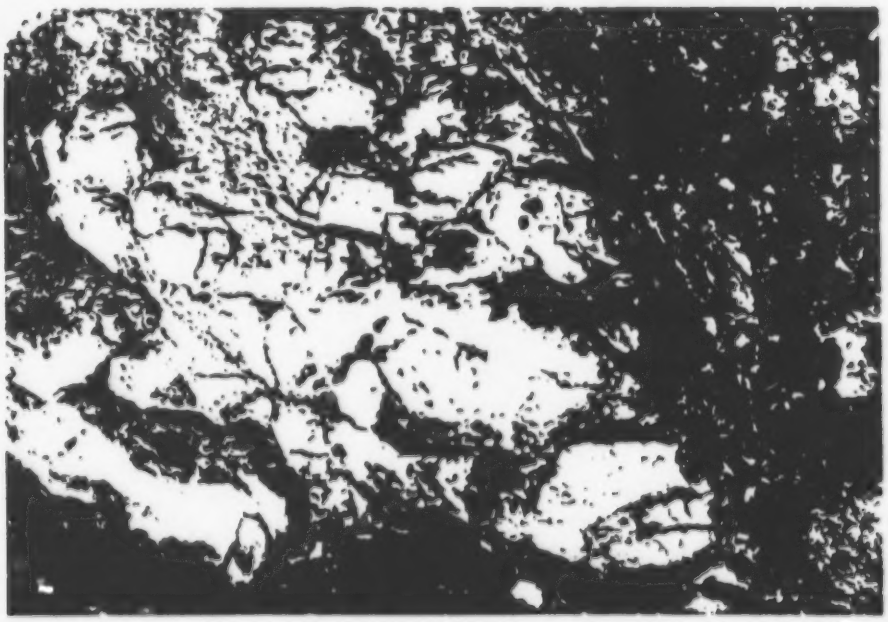

Fig. 22 (#241-21). Large crystals of beryl (yellow) in pegmatite No. 8 northeast of Garnet Point.

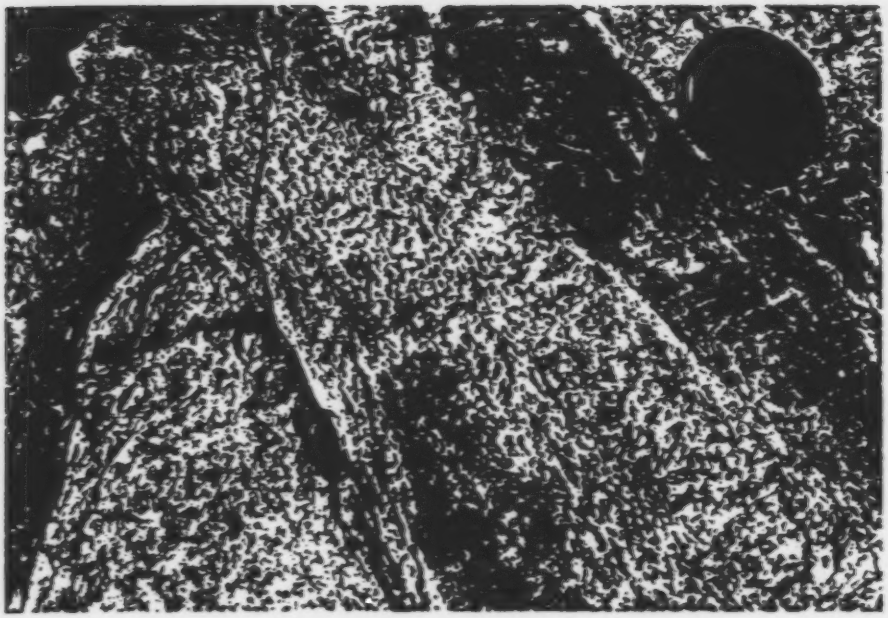

Fig. 23 (#242-13). Tourmalinization of metapelite along contacts with pegmatite No. 7, east of Garnet Point.

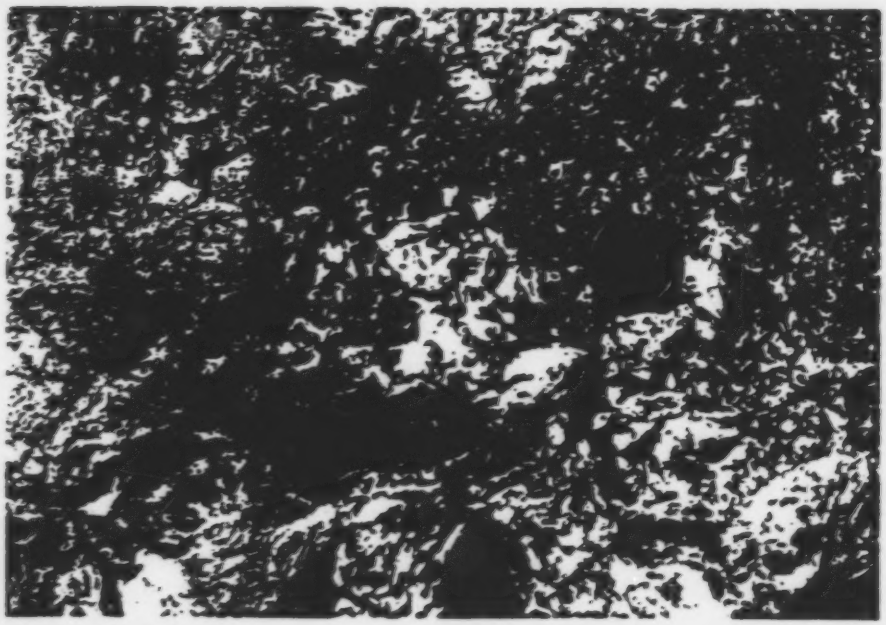

Fig. 24 (#242-17). Euhedral beryl (yellowish-green) and altered triphylite (dark brown) in pegmatite No. 7, east of Garnet Point.

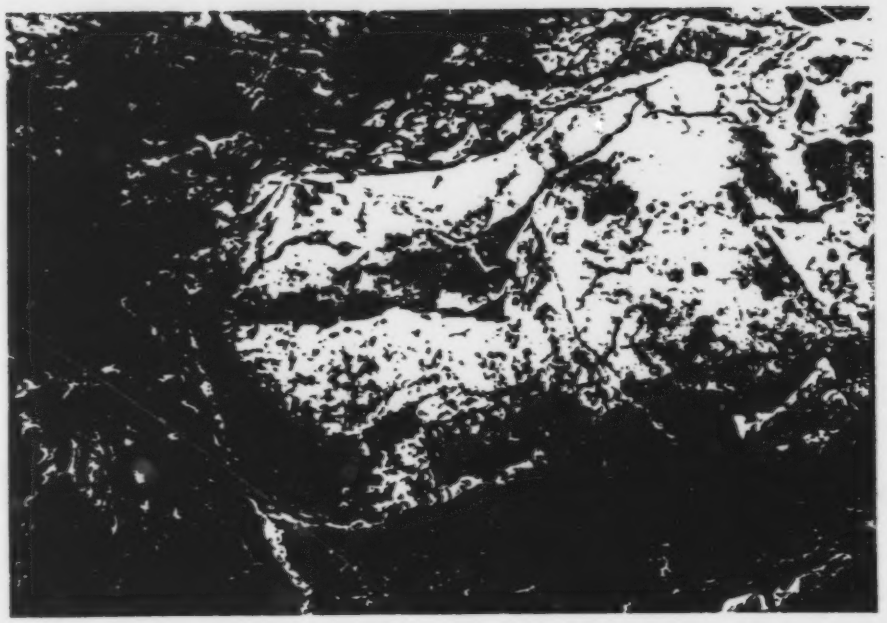

Fig. 25 (#240-23). Quartz vein rimmed by black tourmaline along contacts with chlorite-garnet schist, at Garnet Point.

Fig. 26 (#240-30). Quartz vein rimmed by black tourmaline along contacts with metapelite, east of Garnet Point.

Fig. 27 (#241-3). Micaceous metapelite (lower left), grading into andalusite-rich schist (center) and chlorite-garnet schist (upper right) east of Columbite Bay, at Garnet Point.

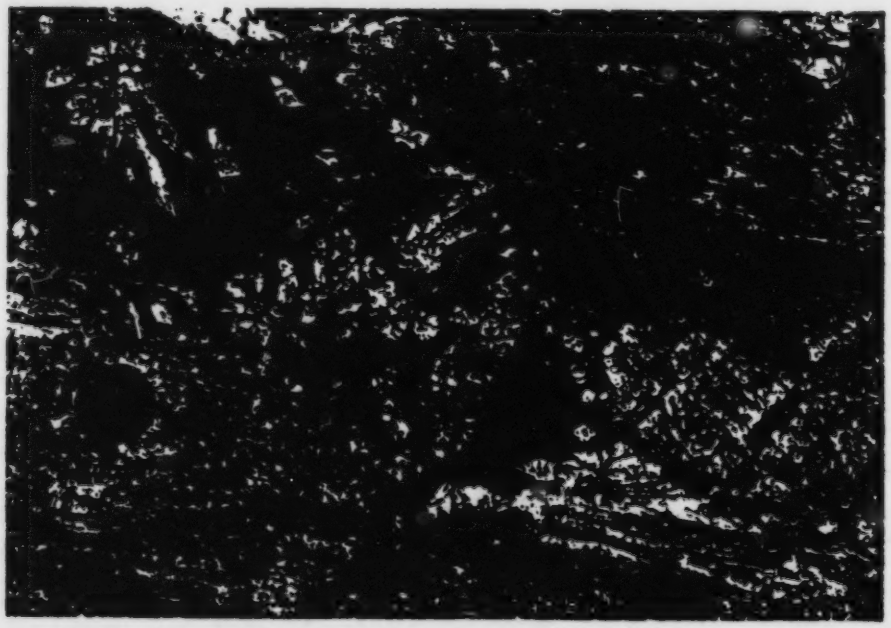

Fig. 28 (#240-32). Radial aggregates of chiastolite in metapelitic schist, with subordinate staurolite (rusty brown), east side of Columbite Bay at Garnet Point.

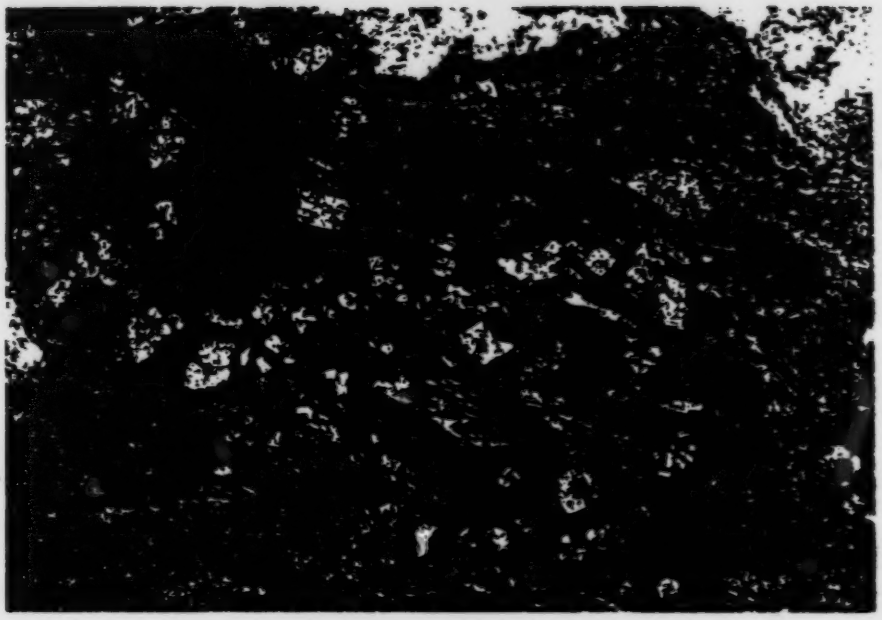

Fig. 29 (#240-31). Cross-sections of chiastolite crystals in metapelite, with subordinate staurolite (rusty brown), east side of Columbite Bay at Garnet Point.

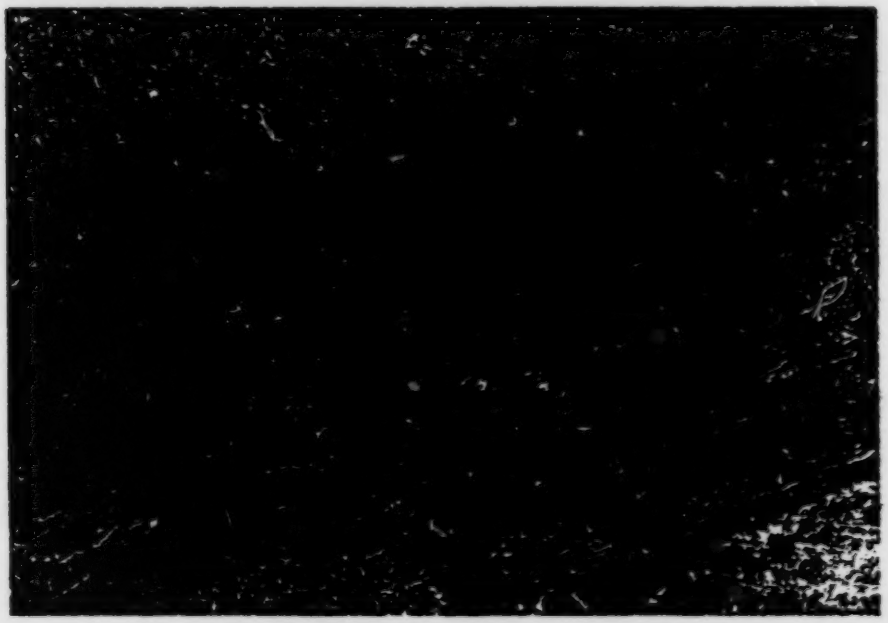

Fig. 30 (#242-7). Chlorite schist with layers enriched in garnet, east of Columbite Bay at Garnet Point.

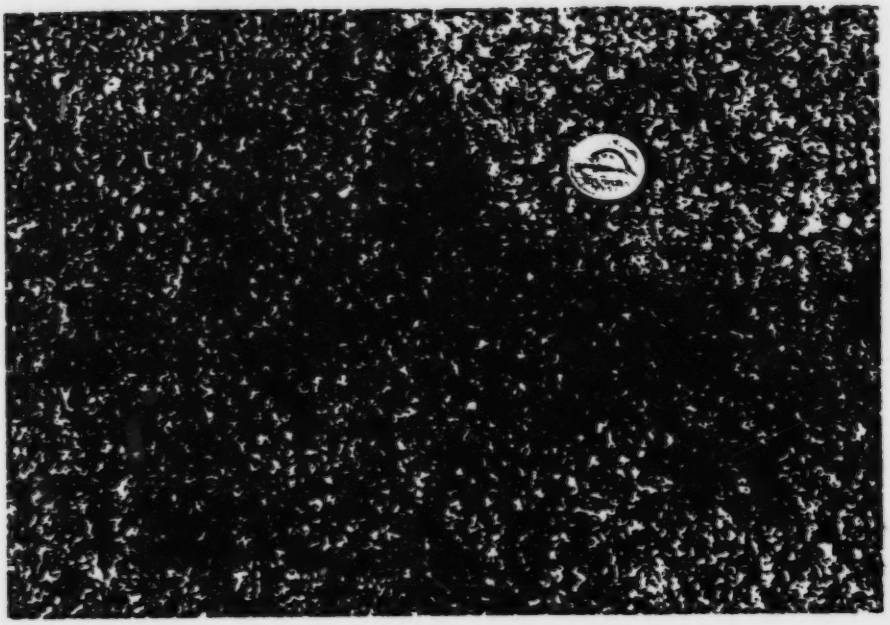

Fig. 31 (#242-9). Weathered surface of garnet-chlorite schist, close to average sea level, at Garnet Point. Garnet crystals are well preserved.

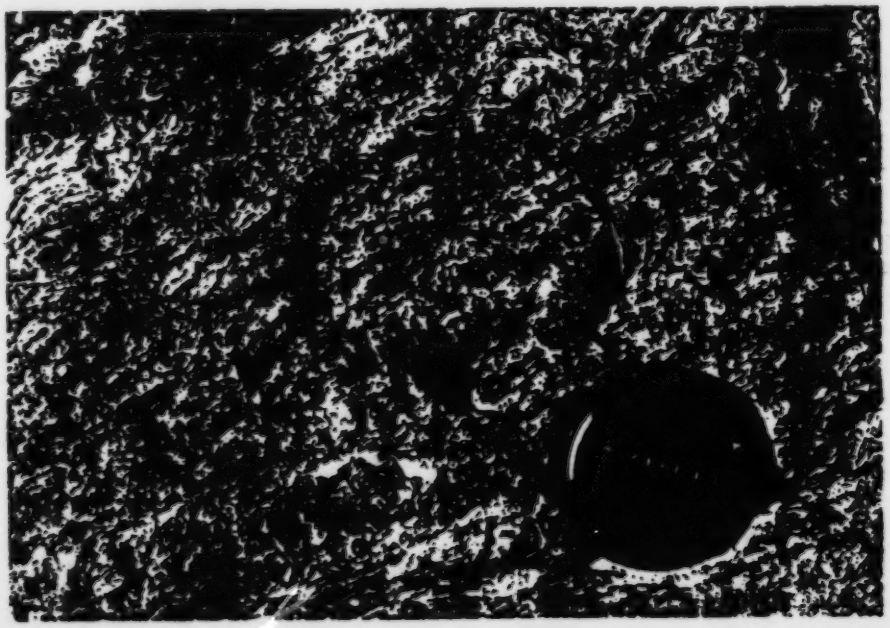

Fig. 32 (#242-10). Staurolite-rich layer in a garnet-bearing chlorite schist, at Garnet Point.

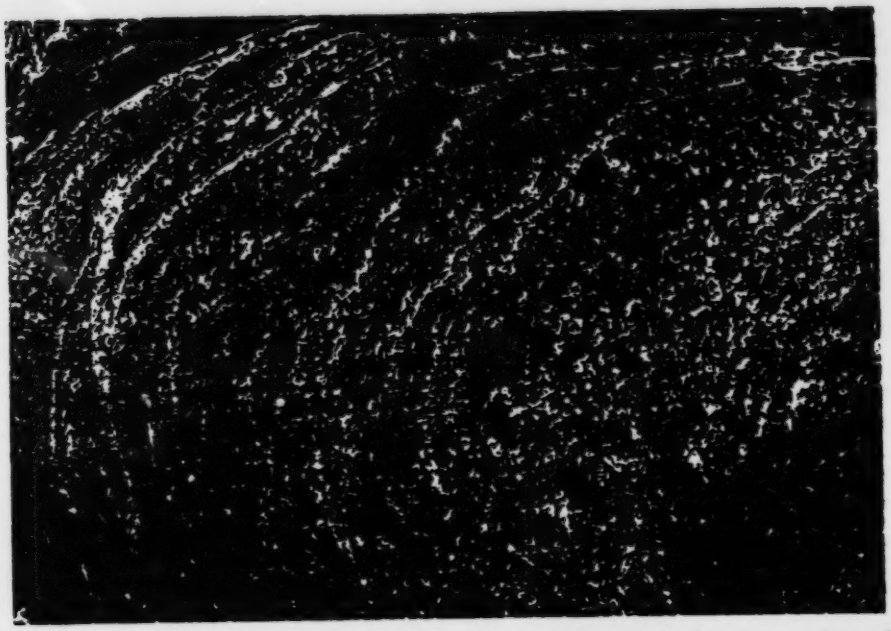

Fig. 33 (#241-11). Metapelite with andalusite-rich layers, shoreline north of Garnet Point.

Fig. 34 (#241-17). Chiastolite in metapelite, shoreline north of Garnet Point.

Fig. 35 (#241-16). Chiastolite in metapelite, shoreline north of Garnet Point.

Fig. 36 (#241-29). Orange granite (foreground) at its apparent tectonic contact with micaschist (background).

Fig. 37 (#242-33). Glass Island (center on the horizon), the quartz locality as seen from Backhouse Camp.

Fig. 38 (#243-14). Ferruginous quartzite on Glass Island, looking along the northwestern shoreline to the east shore of Chantrey Inlet.

Fig. 39 (#243-15). A barren pegmatite dike, viewed along strike close to the southwest termination of Glass Island, hosted by quartzite.

Fig. 40 (#243-25). Excavation of quartz crystals from cavities in quartz veins, close to the termination of bedrock outcrops in the northeastern end of Glass Island. Note the abundance of red clay from the cavities.

Fig. 41 (#244-8). "Boils" of red-clay-coated quartzite debris may indicate location of the quartz vugs. Southwest end of Glass Island.

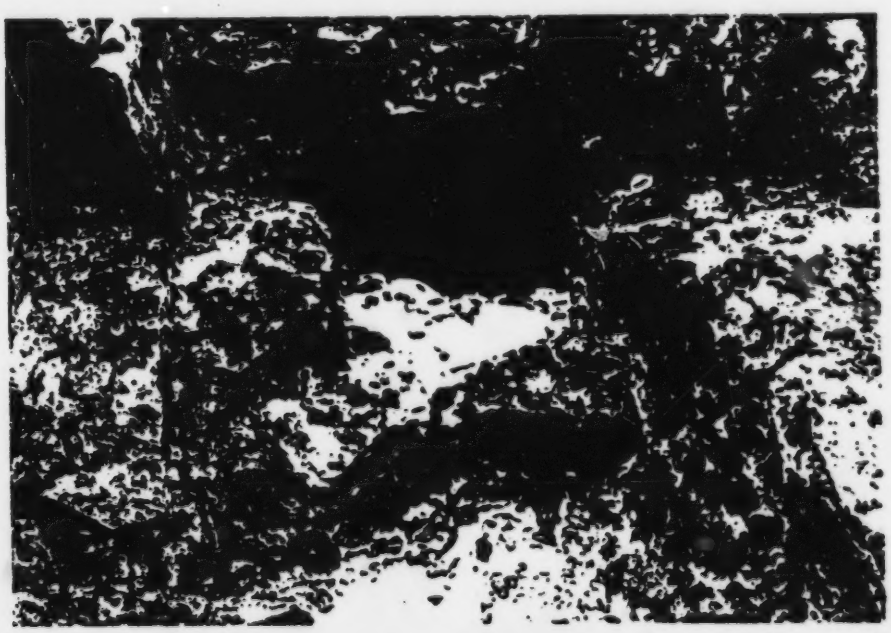

Fig. 42 (#243-33). Caverns after excavated quartz vugs, northwestern side of Glass Island. The entrance is 80 cm wide.

Fig. 43 (#243-26). Vein of columnar quartz in lichen-covered quartzite, northwestern side of Glass Island.

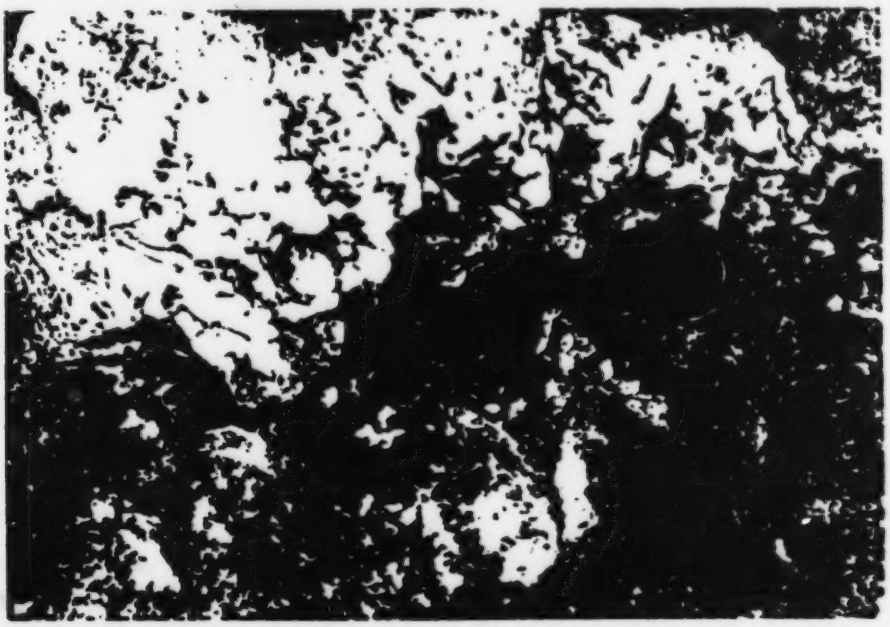

Fig. 44 (#243-27). Vein of columnar quartz in lichen-covered quartzite, northwestern side of Glass Island.

Fig. 45 (#244-21). Complex network of quartz veins cross-cutting ferruginous quartzite, northeastern side of Glass Island.

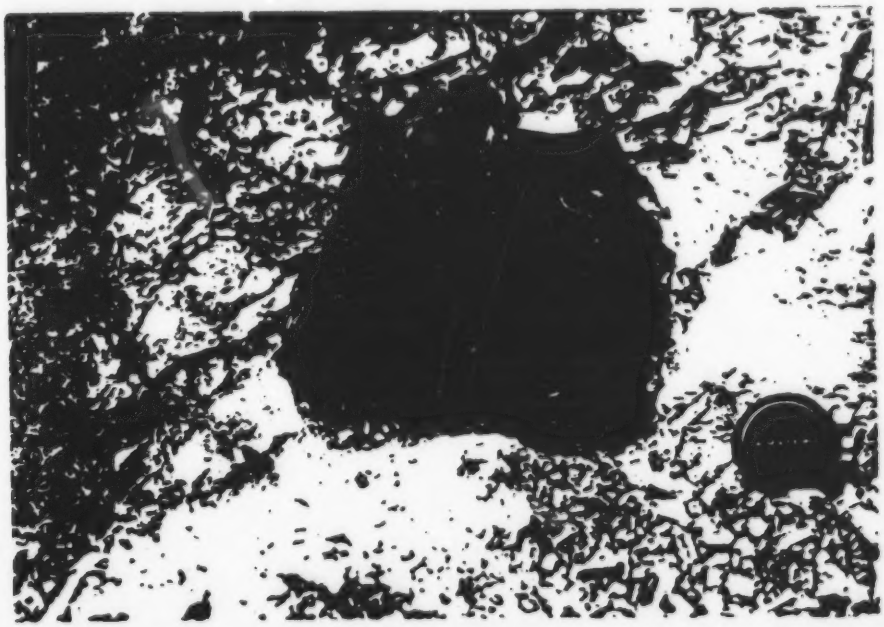

Fig. 46 (#244-17). Vug in a quartz vein, opened by the authors, that yielded 60 quartz crystals ranging from 2 to 10 cm in size, on incomplete excavation; northeastern side of Glass Island.

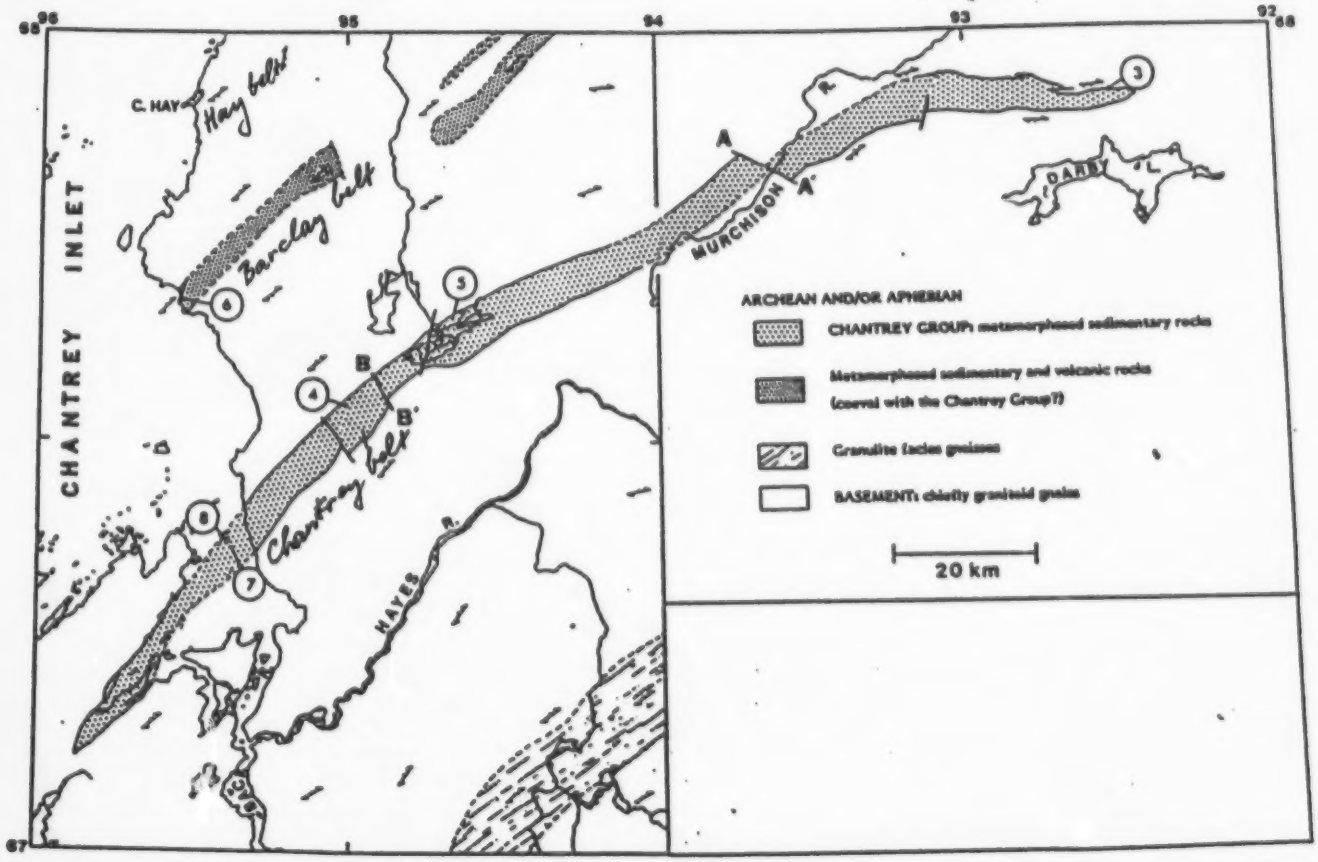

Fig. 47. Regional geology of the eastern side of Chantrey Inlet (from Fritsch et al. 1984).

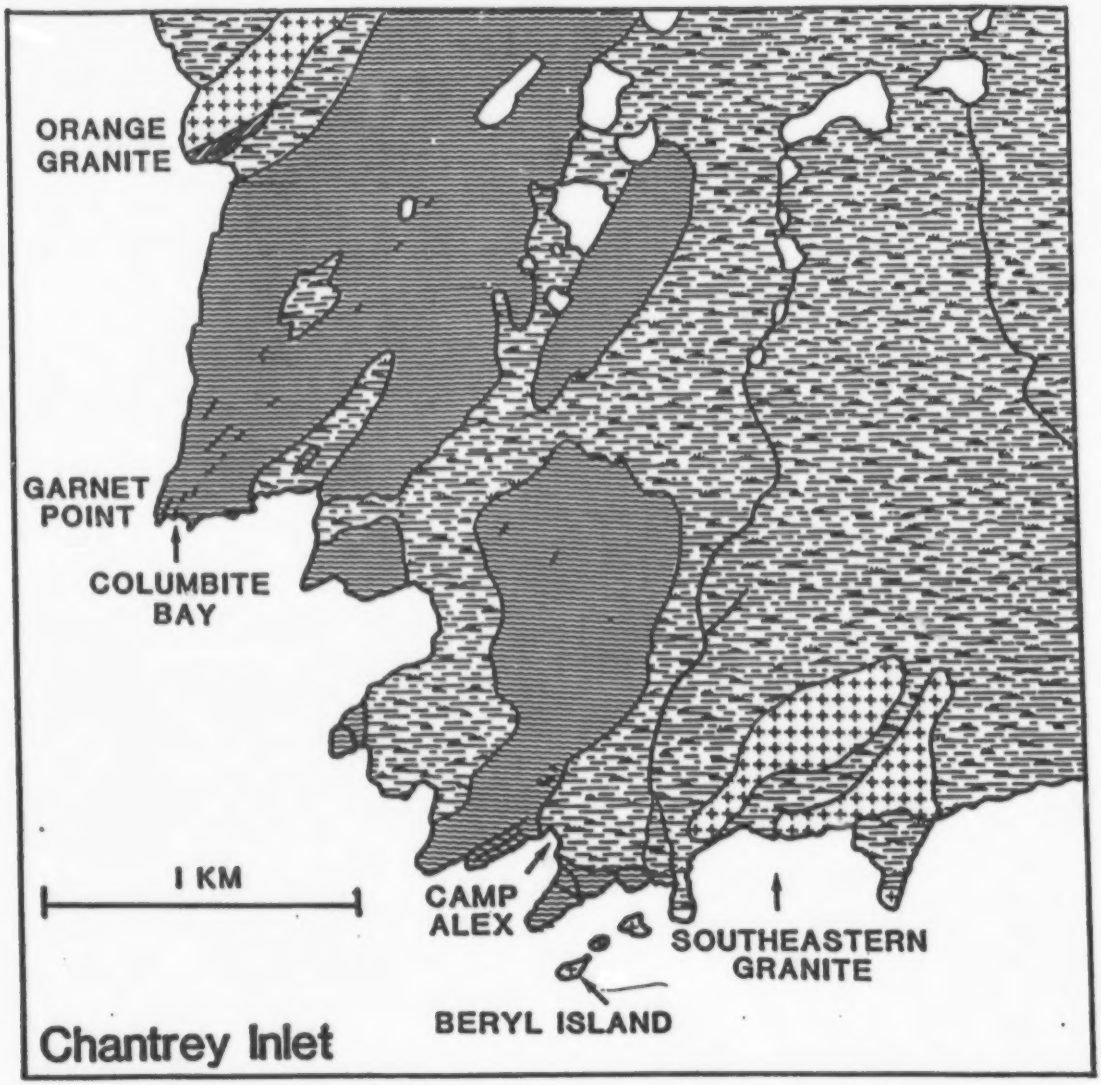

Fig. 48. Schematic geology of the Barclay greenstone belt in the area of M1 and M2 claims. Wavy pattern - metasediments and metavolcanics; NE ruling - micaschist; solid lines - pegmatites.

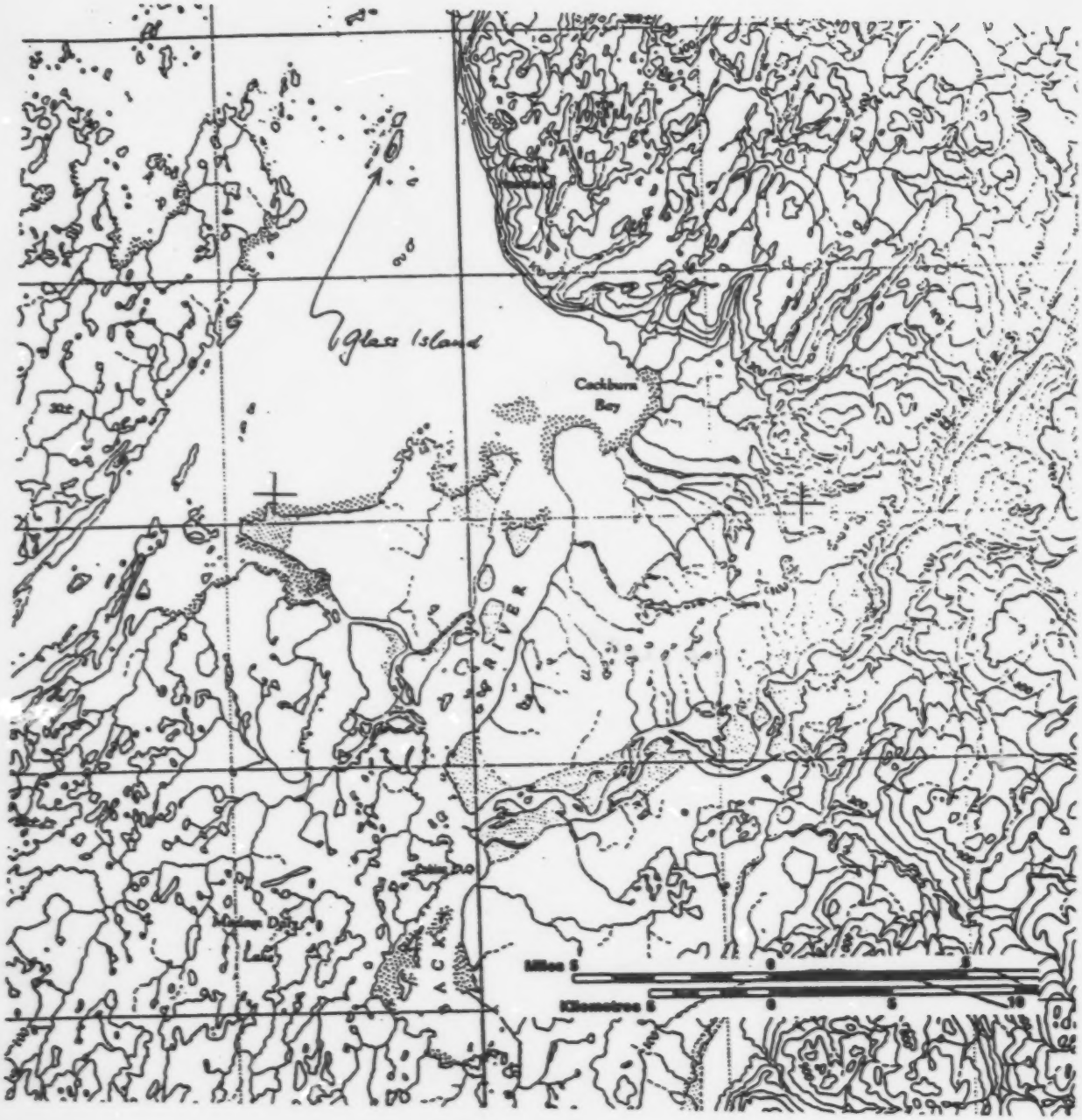

Fig.49. Location of Glass Island in the southern part of Chantrey Inlet (Cape Barclay sheet, 1;250,000).